AMENDMENTS TO CLAIMS

Claim 1 (currently amended): A method for screening an array of materials for a mechanical property~~ies~~, comprising:

~~providing a library of at least four different material samples secured on a substrate;~~

providing a flexible substrate;

depositing a library comprising at least four different material samples onto said substrate;

mounting said substrate onto a mounting member with at least four openings, such that said at least four samples are at least partially aligned with said at least four openings;

~~directing a force from at least one fluid to each of said samples while said samples remain on said substrate, for~~ applying pressure ~~to each of said samples~~ with at least one fluid ~~and~~ to cause~~ing~~ each of said samples to displace in response to said pressure; and

monitoring a response of each of said samples to said pressure with at least one response sensing device.

Claim 2 (original): The method of Claim 1, wherein the method is capable of screening at least two of said samples of said library simultaneously.

Claim 3 (currently amended): The method of Claim 1, wherein the method is capable of screening at least twenty-four ~~of said~~ samples of said library simultaneously.

Claim 4 (currently amended): The method of Claim 1, wherein a screening throughput rate of said library is no greater than about ten minutes.

Claim 5 (currently amended): The method of Claim 1, wherein said pressure is applied to each of said samples in sequential order and a screening throughput rate is no greater than 10 minutes per said sample.

Claim 6 (currently amended): The method of Claim 1, wherein said mechanical properties~~y are~~ is selected from ~~a~~ the group consisting of flexure, uniaxial extension, biaxial compression, shear, stress and strain at failure, toughness, storage modulus, loss modulus, and mixtures thereof.

Claim 7 (currently amended): The method of Claim 1, further comprising ~~of~~regulating environmental conditions of said samples.

Claim 8 (currently amended): The method of Claim 1, wherein said at least one response sensing device is selected from ~~a~~ the group consisting of an electronic pressure sensor, an optical response sensing device selected from ~~a~~ the group consisting of optical reflectance, optical interferometry, shadow illumination, and a combination thereof, an electrical response sensing device selected from ~~a~~ the group consisting of capacitance, resistance, tunneling, electromechanical switching, and a combination thereof, a dual pressure sensing device, and a combination thereof.

Claim 9 (currently amended): The method of Claim 1, wherein said samples are ~~secured~~mounted on said substrates by ~~means selected from a group consisting of~~ mechanically securing, magnetically securing, electromagnetically securing, electromechanically securing, chemically securing, ~~and~~ or a combination thereof.

Claim 10 (currently amended): The method of Claim 1, wherein said pressure applied by ~~directing a force to~~ said fluid is ~~conducted~~ created by a ~~force~~ source selected from ~~a~~ the group consisting of a piston in a cylinder, a temperature controller for varying the temperature of said fluid, a heat transfer device selected from the group consisting of a resistance heater, a liquid-liquid heat exchanger that is connected to a reservoir of exchange fluid, a liquid-gas heat exchanger that is connected to a reservoir of exchange fluid and a combination thereof, and a combination thereof.

Claim 11 (currently amended): The method of Claim 1, wherein said fluid is chemically inert to said library of material samples, allows said pressure applied to said samples to be controlled and variable, and is selected from ~~a~~ the group consisting of air, argon, hydrogen, nitrogen, helium, fluorocarbon liquids, ethanol, water, mercury and mixtures thereof.

Claim 12 (currently amended): The method of Claim 1, wherein at least two ~~of said~~ fluids are ~~both~~ used to apply pressure to one of said samples, said two fluids ~~are~~ being mutually immiscible and wherein separation between said two fluids is maintained by ~~means selected from a group consisting of~~ gravity, surface tension, ~~and~~ or a mixture thereof.

Claim 13 (currently amended): The method of Claim 1, wherein said pressure ~~applied to each of said samples~~ is a negative pressure.

Claim 14 (currently amended): The method of Claim 1, wherein each of said samples ~~is~~ has an area of less than about 100 $mm^{~~2~~2}$.

Claim 15 (currently amended): The method of Claim 1, wherein each of said samples has a thickness of less than about 500 microns.

Claim 16 (currently amended): The method of Claim 1, wherein said pressure ~~applied to each of said samples~~ is selected from ~~a~~ the group consisting of monotonic, sinusoidal, discontinuous, and a combination thereof.

Claim 17 (currently amended): A method for screening an array of materials for a mechanical property~~ies~~, comprising:

providing a flexible substrate;

depositing a library of at least four different material samples onto said substrate;

measuring the thickness of each of said samples;

~~securing~~ mounting said substrate onto a mounting member with at least four ~~plurality of~~ openings, such that said at least four samples are at least partially aligned with said at least four openings ~~to which said samples on said substrate are removeably secured across said openings~~;

compressing at least one transmission fluid against said substrate causing a pressure to be applied to each of said samples;

monitoring a response of each of said samples to said compression with at least one response sensing device selected from a the group consisting of an electronic pressure sensor, an optical response sensing device, an electrical response sensing device, a dual pressure sensing device, and a combination thereof; and

ranking said samples relative to each other according to their respective performance.

Claim 18 (currently amended): The method of Claim 1~~6~~7, wherein the method is capable of screening at least two of said samples of said library simultaneously.

Claim 19 (currently amended): The method of Claim 1~~6~~7, wherein a screening throughput rate of said library is no greater than about ten minutes.

Claim 20 (currently amended): The method of Claim 1~~6~~7, wherein said pressure is applied to each of said samples in sequential order and a screening throughput rate is no greater than 10 minutes per said sample.

Claim 21 (currently amended): The method of Claim 1~~6~~7, wherein said mechanical properyies ~~are~~ is selected from ~~a~~ the group consisting of flexure, uniaxial extension, biaxial compression, shear, stress and strain at failure, toughness, Young's modulus, complex modulus, and mixtures ~~said~~ thereof.

Claim 22 (currently amended): The method of Claim 1~~6~~7, further comprising ~~of~~ regulating environmental conditions of said samples.

Claim 23 (currently amended): The method of Claim 16<u>7</u>, wherein said samples are ~~secured~~<u>mounted</u> on said substrates by mechanically <u>securing</u>, magnetically <u>securing</u>, electromagnetically <u>securing</u>, electromechanically <u>securing</u>, chemically <u>securing</u>, ~~and~~ <u>or</u> a combination thereof.

Claim 24 (currently amended): The method of Claim 16<u>7</u>, wherein said compression ~~is conducted by~~<u>originates from</u> a ~~force~~ source selected from ~~a~~ <u>the</u> group consisting of a piston in a cylinder, a temperature controller for varying the temperature of said transmission fluid, a heat transfer device selected from the group consisting of a resistance heater, a liquid-liquid heat exchanger that is connected to a reservoir of exchange fluid, a liquid-gas heat exchanger that is connected to a reservoir of exchange fluid and a combination thereof, and a combination thereof.

Claim 25 (currently amended): The method of Claim 16<u>7</u>, wherein said transmission fluid is chemically inert to said samples, allows said compression to be controlled and variable, and is selected from ~~a~~ <u>the</u> group consisting of air, argon, hydrogen, nitrogen, helium, fluorocarbon liquids, ethanol, water, mercury and ~~a~~ mixtures thereof.

Claim 26 (currently amended): The method of Claim 16<u>7</u>, wherein two ~~of said~~ transmission fluids are ~~both~~ used to apply pressure to one of said samples, <u>wherein</u> said two transmission fluids are mutually immiscible and separation between said two transmission fluids is maintained by ~~means selected from a group consisting of~~ gravity, surface tension, ~~and~~ <u>or</u> a mixture thereof.

Claim 27 (currently amended): The method of Claim 16<u>7</u>, wherein each of said samples has an area of less than about 100 mm~~2~~<u>^{2}</u>.

Claim 28 (currently amended): The method of Claim 16<u>7</u>, wherein each of said sample<u>s</u> has a thickness of less than about 500 microns.

Claim 29 (currently amended): A method for screening an array of materials for a mechanical property~~ies~~, comprising:

providing a mounting member having a plurality of openings, wherein said mounting member is adapted for connection to a source of a fluid pressure;

placing a flexible substrate having a library of at least two different material samples deposited thereon onto a surface of said mounting member over said openings for defining a substantially gas tight vessel, wherein each of said samples has an area of less than about 100 mm^2 and a thickness of less than 500 microns;

aligning said samples with said openings;

introducing at least one fluid that is chemically inert to said samples, and is selected from a the group consisting of air, argon, hydrogen, nitrogen, helium, fluorocarbon liquids, ethanol, water, mercury and mixtures thereof into said mounting member for applying pressure to each of said samples;

regulating environmental conditions of said samples;

using a source selected from ~~a~~ the group consisting of a piston in a cylinder, a temperature controller for varying the temperature of said transmission fluid, a heat transfer device selected from the group consisting of a resistance heater, a liquid-liquid heat exchanger that is connected to a reservoir of exchange fluid, a liquid-gas heat exchanger that is connected to a reservoir of exchange fluid and a combination thereof, and a combination thereof, to ~~deliver a force to said at least one fluid to each of said samples for~~ apply~~ing~~ pressure to ~~each of said samples while said samples remain on~~ said substrate and causing each of said samples to displace in response to said pressure; and

monitoring a response of each of said samples to said pressure with at least one response sensing device selected from ~~a~~ the group consisting of an electronic pressure sensor, an optical response sensing device, an electrical response sensing device, a dual pressure sensing device, and a combination thereof, wherein said mechanical property~~ies screened are~~is selected from ~~a~~ the group consisting of flexure, uniaxial extension, biaxial compression, shear, stress and strain at failure, toughness, Young's modulus, complex modulus, and mixtures ~~said~~ thereof.

Claim 30 (currently amended): The method of Claim 2~~8~~9, wherein the method is capable of screening at least two of said samples of said library simultaneously.

Claim 31 (currently amended): The method of Claim 2~~8~~9, wherein a screening throughput rate of said library is no greater than about ten minutes.

Claim 32 (currently amended): The method of Claim 2~~8~~9, wherein said pressure is applied to each of said samples in sequential order and a screening throughput rate is no greater than 10 minutes per said sample.

Claim 33 (currently amended): The method of Claim 2~~8~~9, wherein two ~~of said~~ fluids are ~~both~~ used to apply pressure to one of said samples, wherein said two fluids are mutually immiscible and separation between said two fluids is maintained by ~~means selected from a group consisting of~~ gravity, surface tension, ~~and~~ or a mixture thereof.